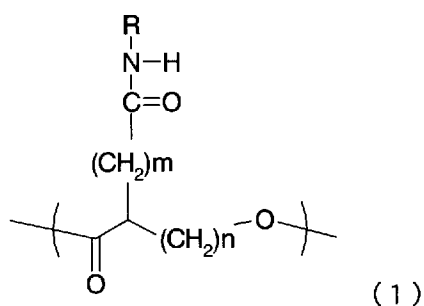


B. Claims

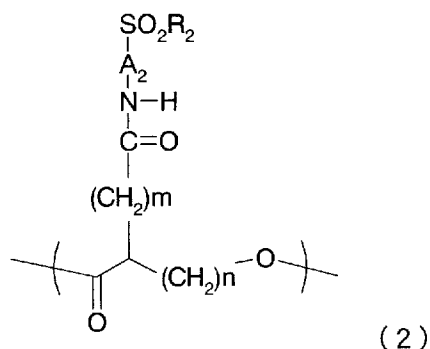
A complete listing of all the claims appears below; this listing replaces all earlier amendments and listings of the claims.

1. (Currently Amended) A polyhydroxyalkanoate comprising one or more units represented by ~~the~~ chemical formula (1) in a molecule;



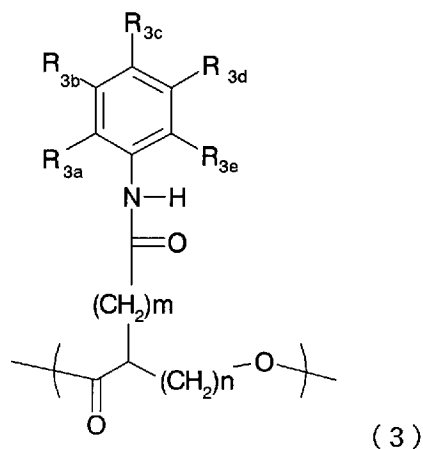
~~Wherein~~ wherein R represents $-A_1-SO_2R_1$, R_1 represents OH, a halogen atom, ONa, OK, or OR_{1a} , R_{1a} and A_1 each independently represent a substituted or unsubstituted aliphatic hydrocarbon structure, a substituted or unsubstituted aromatic ring structure, or a substituted or unsubstituted heterocyclic structure, n represents an integer selected from 1 to 4, m represents an integer selected from 0 to 8, and when multiple units exist, R, R_1 , R_{1a} , A_1 , m, and n ~~each are independently have the above meaning~~ selected for each unit.

2. (Currently Amended) A polyhydroxyalkanoate according to claim 1, comprising one or more units each represented by ~~the~~ chemical formula (2), (3), (4A), or (4B) in a molecule as ~~the~~ units of the chemical formula (1);



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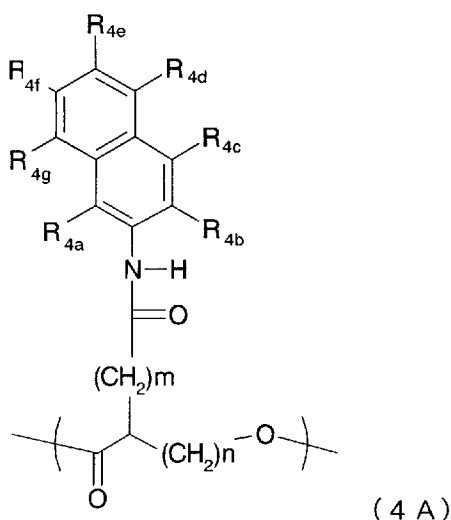
wherein R_2 represents OH, a halogen atom, ONa, OK, or OR_{2a} , R_{2a} represents a linear or branched alkyl group having 1 to 8 carbon atoms, or a substituted or unsubstituted phenyl group, A_2 represents a linear or branched alkylene group having 1 to 8 carbon atoms, n represents an integer selected from 1 to 4, m represents an integer selected from 0 to 8, and when multiple units exist, A_2 , R_2 , R_{2a} , m , and n ~~each are independently have the above meanings~~ selected for each unit,



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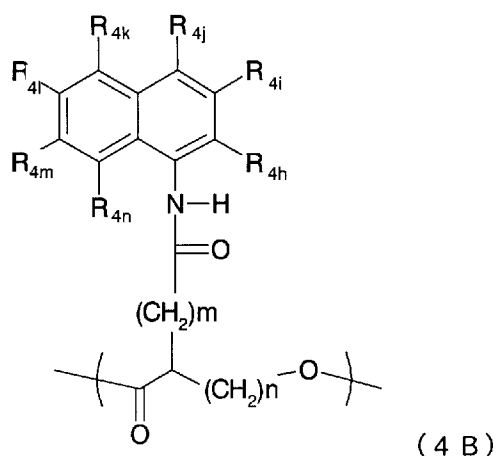
wherein R_{3a} , R_{3b} , R_{3c} , R_{3d} , and R_{3e} each independently represent SO_2R_{3f} (R_{3f} represents OH, a halogen atom, ONa, OK, or OR_{3fl} (R_{3fl} represents a linear or branched alkyl group having 1 to 8 carbon atoms, or a substituted or unsubstituted phenyl group)), a hydrogen

atom, a halogen atom, an alkyl group having 1 to 20 carbon atoms, an alkoxy group having 1 to 20 carbon atoms, an OH group, an NH₂ group, an NO₂ group, COOR_{3g} (R_{3g} represents an H atom, an Na atom, or a K atom), an acetamide group, an OPh group, an NPh group, a CF₃ group, a C₂F₅ group, or a C₃F₇ group (Ph represents a phenyl group), and at least one of these groups represents SO₂R_{3f}, n represents an integer selected from 1 to 4, m represents an integer selected from 0 to 8, and when multiple units exist, R_{3a}, R_{3b}, R_{3c}, R_{3d}, R_{3e}, R_{3f}, R_{3f1}, R_{3g}, m, and n ~~each are independently selected have the above meaning~~ for each unit,



~~Wherein wherein~~ R_{4a}, R_{4b}, R_{4c}, R_{4d}, R_{4e}, R_{4f}, and R_{4g} each independently represent SO₂R_{4o} (R_{4o} represents OH, a halogen atom, ONa, OK, or OR_{4o1} (R_{4o1} represents a linear or branched alkyl group having 1 to 8 carbon atoms, or a substituted or unsubstituted phenyl group)), a hydrogen atom, a halogen atom, an alkyl group having 1 to 20 carbon atoms, an alkoxy group having 1 to 20 carbon atoms, an OH group, an NH₂ group, an NO₂ group, COOR_{4p} (R_{4p} represents an H atom, an Na atom, or a K atom), an acetamide group, an OPh group, an NPh group, a CF₃ group, a C₂F₅ group, or a C₃F₇ group (Ph represents a phenyl group), and at

least one of these groups represents SO_2R_{4o} , n represents an integer selected from 1 to 4 and m represents an integer selected from 0 to 8, and ~~wherein~~ when multiple units exist, R_{4a} , R_{4b} , R_{4c} , R_{4d} , R_{4e} , R_{4f} , R_{4g} , R_{4o} , R_{4ol} , R_{4p} , m, and n ~~each are independently have the above~~ meanings selected for each unit),

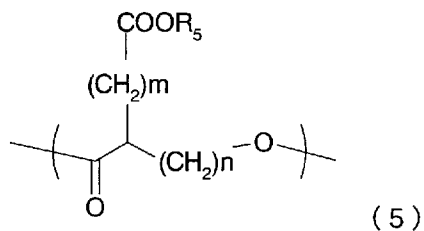


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wherein R_{4h} , R_{4i} , R_{4j} , R_{4k} , R_{4l} , R_{4m} , and R_{4n} each independently represent SO_2R_{4o} (R_{4o} represents OH, a halogen atom, ONa, OK, or ~~OR_{4ol}~~ OR_{4ol} (R_{4ol} represents a linear or branched alkyl group having 1 to 8 carbon atoms, or a substituted or unsubstituted phenyl group)), a hydrogen atom, a halogen atom, an alkyl group having 1 to 20 carbon atoms, an alkoxy group having 1 to 20 carbon atoms, an OH group, an NH_2 group, an NO_2 group, COOR_{4p} (R_{4p} represents an H atom, an Na atom, or a K atom), an acetamide group, an OPh group, an NPh group, a CF_3 group, a C_2F_5 group, or a C_3F_7 group (Ph represents a phenyl group), and at least one of these groups represents SO_2R_{4o} , n represents an integer selected from 1 to 4, m represents an integer selected from 0 to 8, and ~~wherein~~ when multiple units exist, R_{4h} , R_{4i} , R_{4j} , R_{4k} , R_{4l} , R_{4m} , R_{4n} , R_{4o} , R_{4ol} , R_{4p} , m, and n ~~each are independently have the above~~

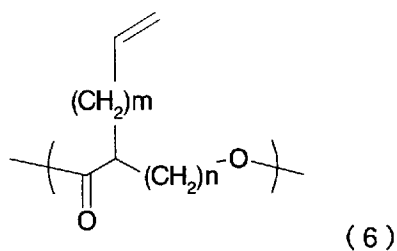
~~meaning~~selected for each unit.

3. (Currently Amended) A polyhydroxyalkanoate comprising one or more units represented by ~~the~~ chemical formula (5);



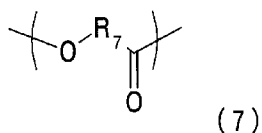
~~Wherein~~wherein R_5 represents a hydrogen atom, a group for forming a salt, or R_{5a} , R_{5a} represents a linear or branched alkyl or aralkyl group having 1 to 12 carbon atoms, or a group having a saccharide, n represents an integer selected from 1 to 4, m represents an integer selected from 0 to 8, when $n = 4$, R_5 represents only a group having a saccharide for $m = 0$, and when multiple units exist, R_5 , R_{5a} , m , and n ~~each are~~ independently ~~have the above~~ ~~meaning~~selected for each unit.)

4. (Currently Amended) A polyhydroxyalkanoate comprising one or more units represented by ~~the~~ chemical formula (6);



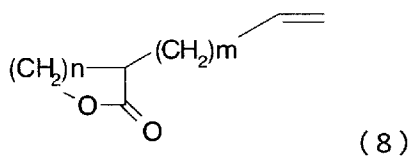
wherein n represents an integer selected from 1 to 4, when n represents an integer selected from 1, 2, and 4, m represents an integer selected from 0 to 8, when n = 3, m represents an integer selected from 0 and 2 to 8, and when multiple units exist, m and n ~~each are~~ independently ~~have the above meaning~~ selected for each unit.

5. (Currently Amended) A polyhydroxyalkanoate according to any one of claims 1 to 4, further comprising a unit represented by ~~the~~ chemical formula (7) in a molecule;



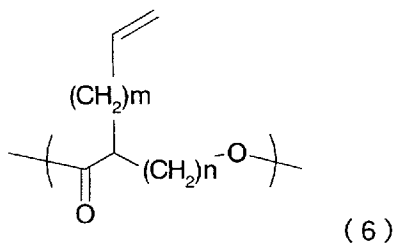
wherein (R₇ represents a linear or branched alkylene group having 1 to 11 carbon atoms, an alkyleneoxyalkylene group each alkylene of which has 1 or 2 carbon atoms (alkylene groups each independently have 1 or 2 carbon atoms), or an alkylidene group having 1 to 5 carbon atoms, which may be substituted by an aryl group, and when multiple units exist, ~~R₇'s~~ R₇ ~~each is~~ independently ~~have the above meaning~~ for each unit.

6. (Currently Amended) A method of producing a polyhydroxyalkanoate represented by ~~the~~ chemical formula (6); comprising ~~the a~~ step of polymerizing a compound represented by ~~the~~ chemical formula (8) in ~~the a~~ presence of a catalyst;



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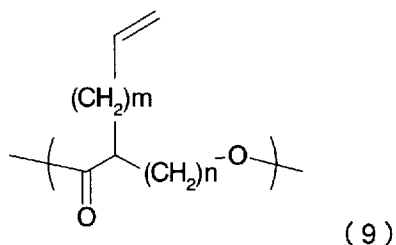
wherein n represents an integer selected from 1 to 4, when n represents an integer selected from 1, 2, and 4, m represents an integer selected from 0 to 8, and when n = 3, m represents an integer selected from 0 and 2 to 8,



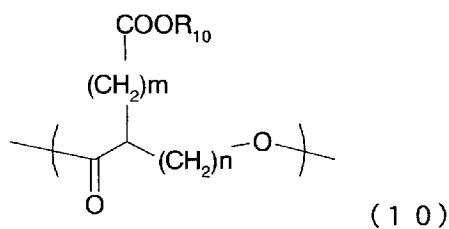
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wherein n represents an integer selected from 1 to 4, when n represents an integer selected from 1, 2, and 4, m represents an integer selected from 0 to 8, when n = 3, m represents an integer selected from 0 and 2 to 8, and when multiple units exist, m and n ~~each are~~ independently ~~have the above meaning~~selected for each unit.

7. (Currently Amended) A method of producing a polyhydroxyalkanoate containing a unit represented by ~~the~~ chemical formula (10), comprising ~~the~~ a step of oxidizing a double bond portion of a polyhydroxyalkanoate containing a unit represented by ~~the~~ chemical formula (9);:

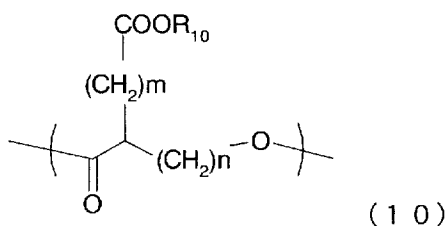


wherein n represents an integer selected from 1 to 4 and m represents an integer selected from 0 to 8, and when multiple units exist, m and n ~~each are~~ independently have the above meaning selected for each unit,

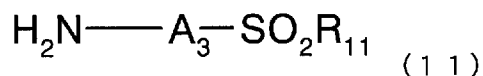


wherein R₁₀ represents a hydrogen atom or a group for forming a salt, n represents an integer selected from 1 to 4, m represents an integer selected from 0 to 8, and when multiple units exist, m, n, and R₁₀ ~~each are~~ independently have the above meanings selected for each unit.

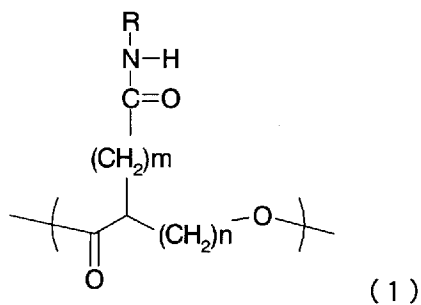
8. (Currently Amended) A method of producing a polyhydroxyalkanoate containing a unit represented by ~~the~~ chemical formula (1), (1) comprising ~~the a~~ step of subjecting a polyhydroxyalkanoate containing a unit represented by ~~the~~ chemical formula (10) and at least one ~~kind of~~ amine compound represented by ~~the~~ chemical formula (11) to a condensation reaction;



Wherein R_{10} represents hydrogen or a group for forming a salt, n represents an integer selected from 1 to 4, m represents an integer selected from 0 to 8, and when multiple units exist, m , n , and R_{10} ~~each are independently have the above meanings~~ selected for each unit;



wherein R_{11} represents OH, a halogen atom, ONa, OK, or OR_{11a} , R_{11a} and A_3 are each independently selected from groups each having a substituted or unsubstituted aliphatic hydrocarbon structure, a substituted or unsubstituted aromatic ring structure, or a substituted or unsubstituted heterocyclic structure, and when multiple units exist, R_{11} , R_{11a} , and A_3 ~~each are independently have the above meanings~~ selected for each unit,

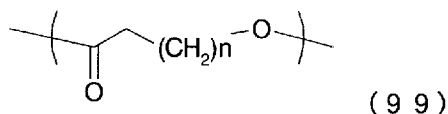


wherein R represents $-A_1-SO_2R_1$, R_1 represents OH, a halogen atom, ONa, OK, or OR_{1a} , R_{1a} and A_1 each independently represent a group having a substituted or unsubstituted aliphatic hydrocarbon structure, a substituted or unsubstituted aromatic ring structure, or a substituted or unsubstituted heterocyclic structure, n represents an integer selected from 1 to 4, m represents an integer selected from 0 to 8, and when multiple units exist, R, R_1 , R_{1a} , A_1 , m, and n ~~each are independently have the above meanings~~selected for each unit.

9. (Currently Amended) A method of producing a polyhydroxyalkanoate containing a unit represented by ~~the~~ chemical formula (101), comprising the steps of:

allowing a polyhydroxyalkanoate containing a unit represented by ~~the~~ chemical formula (99) to react with a base; and

allowing ~~the a~~ compound obtained in the foregoing step to react with a compound represented by ~~the~~ chemical formula (100),;



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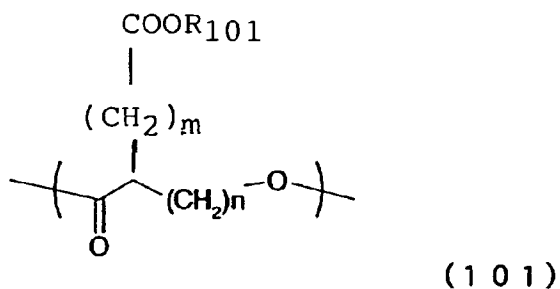
wherein n represents an integer selected from 1 to 4, and when multiple units exist, n's ~~each n is independently have the above meanings~~selected for each unit,



(1 0 0)

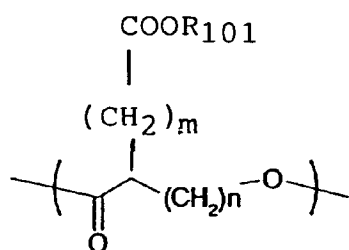
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wherein m represents an integer selected from 0 to 8, X represents a halogen atom, R₁₀₀ represents a linear or branched alkyl or aralkyl group having 1 to 12 carbon atoms, and when n = 4 in the chemical formula (99), m is not equal to 0,



wherein n represents an integer selected from 1 to 4, when n represents an integer selected from 1 to 3, m represents an integer selected from 0 to 8, when n = 4, m represents an integer selected from 1 to 8, R₁₀₁ represents a linear or branched alkyl or aralkyl group having 1 to 12 carbon atoms, and when multiple units exist, R₁₀₁, m, and n ~~each are~~ independently have ~~the above meaning selected~~ for each unit.

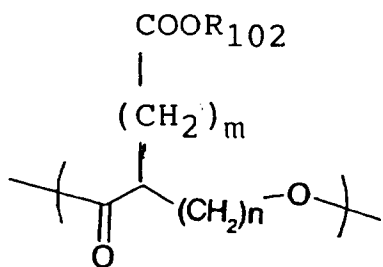
10. (Currently Amended) A method of producing a polyhydroxyalkanoate containing a unit represented by ~~the~~ chemical formula (102); (102) comprising ~~the a~~ a step of hydrolyzing a polyhydroxyalkanoate containing a unit represented by ~~the~~ chemical formula (101) in ~~the a~~ a presence of an acid or an alkali or ~~the a~~ a step of subjecting the polyhydroxyalkanoate to hydrogenolysis including a catalytic reduction;



(1 0 1)

2

wherein n represents an integer selected from 1 to 4, when n represents an integer selected from 1 to 3, m represents an integer selected from 0 to 8, when n = 4, m represents an integer selected from 1 to 8, R₁₀₁ represents a linear or branched alkyl or aralkyl group having 1 to 12 carbon atoms, and when multiple units exist, R₁₀₁, m, and n ~~each are~~ independently have the above meaning selected for each unit,



(1 0 2)

2

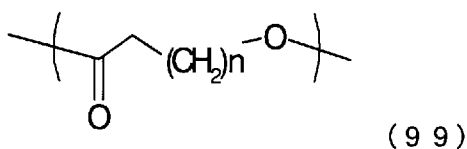
wherein R₁₀₂ represents hydrogen or a group for forming a salt, n represents an integer selected from 1 to 4, when n represents an integer selected from 1 to 3, m represents an integer selected from 0 to 8, when n = 4, m represents an integer selected from 1 to 8, and when multiple units exist, R₁₀₂, m, and n ~~each are~~ independently have the above meanings selected for each unit.

11. (Currently Amended) A method of producing a polyhydroxyalkanoate

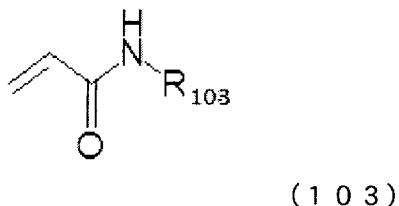
containing a unit represented by ~~the~~ chemical formula (104), (104) comprising the steps of:

allowing a polyhydroxyalkanoate containing a unit represented by ~~the~~ chemical formula (99) to react with a base; and

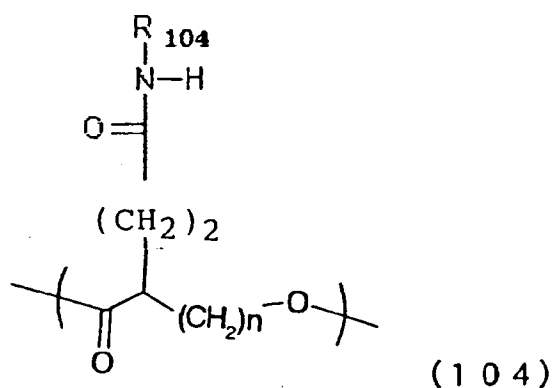
allowing ~~the~~ a compound obtained in the foregoing step to react with a compound represented by ~~the~~ chemical formula (103), 2:



~~(In the formula, wherein n represents an integer selected from 1 to 4. When, and~~
when multiple units exist, n's each is independently have the above meanings selected for each
unit). 2



~~Wherein~~ wherein R₁₀₃ represents -A₁₀₃-SO₂R_{103a}, R_{103a} represents OH, a halogen atom, ONa, OK, or OR_{103b}, R_{103b} and A₁₀₃ are each independently selected from groups each having a substituted or unsubstituted aliphatic hydrocarbon structure, a substituted or unsubstituted aromatic ring structure, or a substituted or unsubstituted heterocyclic structure, and when multiple units exist, R₁₀₃, R_{103a}, R_{103b}, and A₁₀₃ ~~each are~~ each are independently ~~have the above meaning selected~~ selected for each unit, 2



Wherein ~~wherein~~ wherein n represents an integer selected from 1 to 4, R₁₀₄ represents - A₁₀₄-SO₂R_{104a}, R_{104a} represents OH, a halogen atom, ONa, OK, or OR_{104b}, R_{104b} and A₁₀₄ each independently represent a group having a substituted or unsubstituted aliphatic hydrocarbon structure, a substituted or unsubstituted aromatic ring structure, or a substituted or unsubstituted heterocyclic structure, and when multiple units exist, R₁₀₄, R_{104a}, R_{104b}, A₁₀₄, and n are each independently ~~have the above meaning~~ selected for each unit.